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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/658,811	09/10/2003	Yasuo Matsumura	117092	2869

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EXAMINER	
RODEE, CHRISTOPHER D	
ART UNIT	**PAPER NUMBER**
1756	

DATE MAILED: 12/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/658,811	MATSUMURA ET AL.	
	Examiner	Art Unit	
	Christopher RoDee	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 October 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) *18-20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7/18/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of group I, claims 1-17 in the reply filed on 18 October 2005 is acknowledged. The traversal is on the ground(s) that no serious burden exists that would warrant restriction between the groups proposed by the Examiner. This is not found persuasive because the search for the toner requires no search of the method of making or using the toner. Further, art applicable against the toner would not necessarily anticipate or render obvious the recited methods. The searches are not coextensive, and a serious burden of search is present.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 2, 4-7, 14, and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Tsubuko *et al.* In US Patent Application Publication 2003/0099894 considered with *Polymer Handbook*, 2nd ed, pp. III-143 – III-179.

This rejection was presented in the last Office action. The instant claims have been amended to specify that the copolymer consists of a combination of a high Tg monomer, a low Tg monomer, and a hydrophilic monomer, each as specified in the claims. Applicants traverse the rejection over Tsubuko as previously set forth because an additional monomer (i.e., glycidyl

methacrylate) is required. This monomer is stated as being excluded by the instant claims by the new consisting of language.

In response the Examiner again relies on Tsubuko's Example 7. This binder resin in this example contains stearyl (octadecyl) methacrylate, which is a low Tg monomer (homopolymer Tg = 173 K; see *Polymer Handbook*, p. III-148), methyl methacrylate, which is a high Tg monomer (see spec. p. 19), methacrylic acid, which is a hydrophilic monomer, and hydroxymethyl methacrylate, which is also a hydrophilic monomer. The instant claims limit the copolymer to the recited types of monomers but do not appear to limit the claims to only one of each type. In Tsubuko's Example 7, each monomer meets the requirements of a high Tg monomer, a low Tg monomer, or a hydrophilic monomer. There is no monomer outside the scope of the recited monomers. As such, the reference is still seen as applicable to the instant claims.

The other examples previously presented also meet the requirements of the instant claims because glycidyl methacrylate is a low Tg monomer (spec. p. 19, l. 22-23), contrary to applicant's remarks in the response on page 13, top. Examples 6 and 13 have two low Tg monomers. As discussed above, the instant claims are not seen as excluding two monomers from one or more of the requisite monomer types. The rejection is still seen as proper and is maintained.

Claims 1-5, 13, and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Tanaka *et al.* in US Patent 4,504,563.

Tanaka discloses a toner having a vinyl copolymer binder with a specific acid value. As seen in patent claim 7, the binder is a methyl methacrylate/iso-butyl methacrylate/methacrylic acid copolymer. As seen on specification pages 9 and 10, methyl methacrylate is a low Tg

monomer, butyl methacrylate is a high Tg monomer, and methacrylic acid is a hydrophilic monomer, each according to the respective structural formulae. The weight average molecular weight of the polymer is 50,000 to 500,000 (col. 3, l. 31-54). The toner also contains a dye or pigment as a colorant (col. 4, l. 45-54). The toner has a size of about 10 to 20 μm (col. 4, l. 64-65) and the binder resin and the colorant can be spray dried to give a fine powder, followed by mixing with carrier particles to form a two component developer (col. 4, l. 65 – col. 5, l. 2). Because the toner powder is formed by spray drying it appears that it would have the same characteristics (e.g., shape) as present in the product-by-process limitation of pending claim 3.

Claim Rejections - 35 USC § 103

Claims 11, 12, 14 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka *et al.* in US Patent 4,504,563 in view of Diamond, Arthur S & David Weiss (eds.) *Handbook of Imaging Materials.* New York: Marcel-Dekker, Inc. (11/2001) pp. 155-164, 173-187, 209, 210, and 217-220.

Tanaka was discussed above and those remarks are incorporated here. Tanaka does not appear to disclose the claimed average particle diameter of claim 11, the particle size distribution of claim 12, the release agent of claim 14, or the carrier size of claim 17. Tanaka does teach that the toner has a size of about 10 to 20 μm, as noted above

Diamond teaches on page 159 that the typical size of toner particles is 6 to 7 μm. Diamond also teaches that release agents, such as polyethylene or polypropylene wax, are typically added to toner formulations to improve offset resistance during the fixing process. Diamond further discloses that the particle size distribution should be minimized to prevent toner scattering giving "dirt" and copy quality problems (p. 187) and that the average size used is

typically from 7 to 12 um. Diamond states that the toner size distribution should be minimized to give better copy quality. Note the common concern in the specification at the bottom of page 27. Diamond also discloses the typical carrier particle size as being from 3 to 50 times that of the toner particle average size (p. 210). Specifically disclosed carrier particle sizes are 100 µm and 130 µm for iron and 10 to 120 µm for spherical ferrites (p. 219).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to add a releasing agent to the toner of Tanaka because this reduces the amount of toner offset during fixing, which is specific concern in Matsunaga (col. 1, l. 15-19). The artisan seeking to improve offset resistance in Tanaka would look to additional references in the art to further improve this feature. The artisan would also have found it obvious to produce the toner with a size of about 6 to 7 µm with a narrow particle size distribution because Diamond teaches that smaller sized toner particles are currently used to improve line resolution and a narrow particle size distribution aid copy quality through use. The claimed GSDv value is seen as an optimization of the particle size distribution because this numeric value would approach 1 as the size distribution is minimized. It would have been obvious to one having ordinary skill in the art at the time the invention was made to choose a size for the carrier particle in Tanaka's two-component developer that is within those sizes conventionally used in the art and within the general guidance of 3 to 50 times that of the toner particles in order to form an effective two-component developer.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka *et al.* in US Patent 4,504,563 in view of Diamond, Arthur S & David Weiss (eds.) *Handbook of Imaging Materials*. New York: Marcel-Dekker, Inc. (11/2001) pp. 155-164, 173-187, 209, 210, and 217-

220 as applied to claims 11, 12, 14 and 17 above, and further in view of Shiraishi *et al.* in US Patent Application Publication 2003/0077534.

Tanaka and Diamond were discussed above. Diamond also teaches that charge control agents are typically used in toners to give the proper level of charge to the toner (pp. 180-181). However, a compound with a carboxyl group as the charge control agent is not disclosed.

Shiraishi discloses a charge control agent having a carboxyl group in the formula (1), particularly when R is hydrogen.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use Shirashi's charge control agent in the toner of Tanaka because Diamond teaches that charge control agents are conventional in the art and Shiraishi discloses a specific charge control agent that is moisture resistant and inexpensive (¶ [0019], [0020]), among other features, while giving good triboelectric charging characteristics.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka *et al.* in US Patent 4,504,563 in view of Carlson in US Patent 2,297,691.

Tanaka was discussed above and those remarks are incorporated here. Tanaka does not appear to disclose the claimed shape factor and surface index of claim 9. However, Carlson teaches that spherical toner particles are advantageous because this shape gives a more accurate distribution of the powder when developing a latent image (p. 3, left column, bottom, to right column, top).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to produce the toner of the Tanaka with a generally spherical shape because this shape gives a more accurate distribution of the powder when developing a latent image. The claimed SF-1 values appears to relate the sphericity of the toner and values closer

to 100 give a more spherical shape (spec. p. 25; Example 2, p. 51; Example 4, p. 54). Thus the teaching in Carlson of a generally spherical shape implicitly teaches the artisan to obtain an SF-1 value near 100.

Claims 9, 10, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka *et al.* in US Patent 4,504,563 in view of Carlson in US Patent 2,297,691 as applied to claim 9 above, and further in view of Kojima *et al.* in US Patent 6,214,510.

Tanaka and Carlson were discussed above and those remarks are incorporated here. Tanaka does not appear to disclose the surface property index of the instant claims, but Kojima teaches that a toner having a surface property index of 2.0 or less gives improved transfer properties (col. 7, l. 4-32). Kojima also teaches that a SF1 value near 100 correlates to a spherical shaped toner as discussed above (col. 5, l. 11-50) and that a generally spherical shaped toner is advantageous. Further Kojima teaches that the colorant particle size in a toner should be from 10 nm to 1 μm in order to avoid toner scattering (col. 10, l. 13-24). A colorant size of 250 nm is exemplified in Example 1 (col. 24, l. 5-6).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to produce the toner of Tanaka with a surface property index of 2.0 or less and a SF1 value near 100 because Carlson teaches that generally spherical toner ives a more accurate distribution of the powder when developing a latent image while Kojima teaches surface property index of 2.0 or less gives improved transfer properties. The artisan would also have found it obvious to optimize the size of the colorant in Tanaka because Kojima teaches that specifically sized colorant reduces toner scattering and liberation of colorant particles from the toner.

Information Disclosure Statement

The IDS filed 18 July 2005 has been considered. However, none of these references disclose a copolymer consisting of the requisite monomers. For example, GB 1069158 (Examples 1-4) and Nishibayashi (Example 18) disclose maleic acid as a monomer unit but no such unit is permitted in the instant claims. Tsubuko's polymer (9) in column 4, cited in the EPO search report, and Kosel's Example IV have no high Tg monomer. The cited JP document does not appear relevant.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher RoDee whose telephone number is 571-272-1388. The examiner can normally be reached on most weekdays from 6:00 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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cdr
28 November 2005

CHRISTOPHER RODEE
PRIMARY EXAMINER